

LK-MC300 series  
vibrating rod level switch



## I. OVERVIEW

The single rod vibration level switch of German LK is caused by the resonance of piezoelectric crystal. When the material is damped, the amplitude decreases sharply and the frequency and phase change obviously. These changes will be detected by the internal electronic circuit. After processing, it is converted to switch signal output. The product can detect, control and alarm the high and low position of the tank, which is suitable for all kinds of liquid, powder and granular solid. The utility model has the advantages of simple operation, reliable operation and strong applicability. It is basically maintenance-free, and the tuning fork and output are all in working state. They are indicated by light-emitting diodes and can be adjusted according to habits. It is equipped with three input modes (DC 24 V、AC 110 V and AC 220 V) and various output modes (DC current output type, relay contact output type, DC voltage output type). All types have high or low fault alarm mode and optional instrument switch sensitivity.

## II. Technical parameters

Medium temperature range : -20°C ~ 150°C

Temperature : -20℃~80℃

Ambient humidity :  $95\% \leq \text{RH}$

Medium under test: liquid, powder or granular solid

Medium density measured: solid  $\geq 0.1$  g/cm<sup>3</sup>

Liquid  $\geq 0.7 \text{ g/cm}^3$

Measured solid particle size :  $\leq 10$  mm

Maximum liquid viscosity : < mm<sup>2</sup>/s 1000

Deposition angle of measured medium :  $\geq 200$ 

Pressure range :  $\leq 1$  MPa

Shell Material: Die-cast Aluminum Alloy

Fork material :1 Cr18Ni9Ti/316/316L

Explosion proof grade: Ex D II CT4; II 1/2D Ex tD III C T135° C Da/Db

Shell Protection Level: IP66

Connection mode :G1" thread;flange (user-defined)

Flange (user selected)

Electrical parameters:

1. supply voltage: DC24V;AC220V 50HZ

2. output: relay output :5 A 220V AC

3A 24V DC

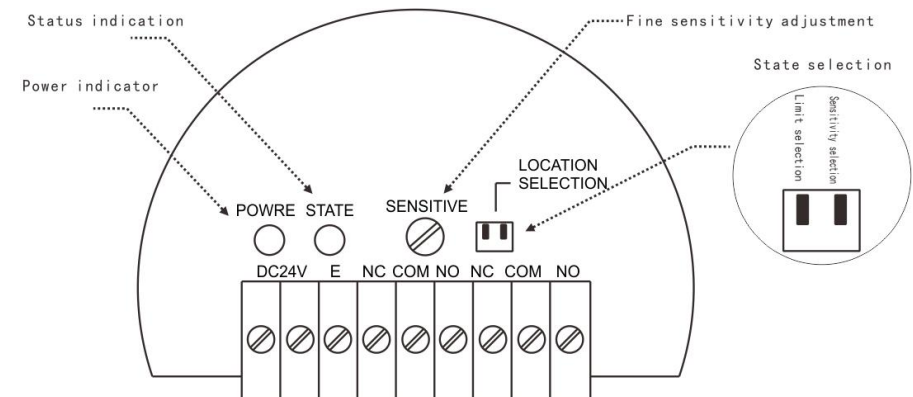
3. power consumption:  $W \leq 2$

tuning fork vibration frequency :  $300 \pm 50$  Hz

Level of ambient vibration: V.L.4 acceleration not greater than 1 g

Switch signal action time: S 1-60

### III. Electrical connections



After switching on the power supply, the equipment is delayed for 5 seconds to enter normal operation, and the limit will be limited when the upper limit alarm Select to the top, the lower limit alarm will limit the selection to the bottom.

Dial the sensitivity selection to the top for high sensitivity and to the bottom for low sensitivity.

The sensitivity is increased counterclockwise and clockwise.



## LK-MC300 series Tuning fork level switch



### 一、 Product principle

The tuning fork level switch drives the fork body to vibrate through the resonance of the piezoelectric crystal. When the fork body touches the material, the amplitude, frequency and phase change significantly. These changes are detected and processed by the internal circuit and converted into switch signal output. Tuning fork level switch is suitable for level control and alarm of various liquids and solids. Because there is no mechanical wear, it is basically maintenance-free, simple to use, free of debugging, reliable in operation, and can be integrated in structure. It is widely used in various medical, chemical, metallurgical, power plants and other industries.

### 二、 Product Features

The instrument adopts various chips with high performance, high speed and high reliability to optimize signal acquisition, algorithm and mechanical structure. Thereby, the response speed, function and reliability of the product are improved. The instrument can switch the alarm mode according to the demand. Sensitivity is custom adjusted according to material and site requirements. According to the on-site use environment, products with high protection, explosion-proof, high temperature and high pressure resistance can be provided. In addition, there are various options for the power supply mode, connection mode, and wetted material of the product for users to match.

### 三、 Instrument parameters

#### 1. Measured medium and environment

|                      |                                                           |                                                               |                       |
|----------------------|-----------------------------------------------------------|---------------------------------------------------------------|-----------------------|
| medium temperature:  | -30°C ~ 150°C (customizable)                              | Medium pressure:                                              | ≤2MPa (customizable)  |
| Ambient temperature: | -30°C ~ 70°C                                              | environment humidity:                                         | ≤80%RH (customizable) |
| Media Requirements:  | Liquid: Density≥0.5g/cm <sup>3</sup><br>Viscosity≤10000cp | solid: density≥0.1g/cm <sup>3</sup><br>Particle diameter≤10mm |                       |

#### 1. Electrical parameters

|                    |                                           |                       |                                                                |
|--------------------|-------------------------------------------|-----------------------|----------------------------------------------------------------|
| Supply voltage:    | dual voltage: 24VDC&220VAC (customizable) | output signal:        | Passive double pole double throw relay DPDT 8A 220VAC/3A 24VDC |
| Power consumption: | <1W                                       | Electrical Interface: | M20*1.5、1/2NPT (customizable)                                  |

#### 1. Instrument parameters

|                 |                                        |                                |                                                                                                                                   |
|-----------------|----------------------------------------|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| shell material: | Die-cast aluminum alloy (customizable) | Fork body and wetted material: | Fork body: conventional 316L<br>Extension tube: conventional 304, 316L<br>Customized: titanium, Hastelloy C, fluorine spray, etc. |
| Protection      | IP66                                   | Explosion-                     | ExdIICT4;II 1/2 DExTD IIICT 135 °C D a / Db                                                                                       |

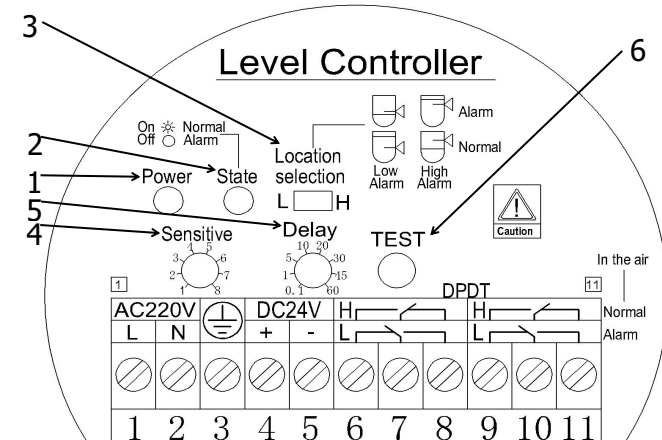
|                    |                                                 |                      |                                                    |
|--------------------|-------------------------------------------------|----------------------|----------------------------------------------------|
| class:             |                                                 | proof grade:         |                                                    |
| Connection method: | Thread: 1" NPT : G 1"<br>Flange: DN20 (minimum) | Vibration frequency: | 100MM fork body: ~400HZ<br>38MM fork body: ~1100HZ |
| Response time:     | Trigger time: <0.5s<br>Start-up time: <0.5s     | Hysteresis setting:  | ~3MM (customizable)                                |

### 四、 Wiring and debugging

The wiring of the instrument is shown in the figure, 1, 2 terminals 220VAC power supply, 4, 5 terminals 24VDC power supply, select a group of power wiring. 3 terminals are earth, 6, 7, 8 terminals and 9, 10, 11 terminals are two sets of relay DPDT outputs.

#### Panel ID:

1. Power indicator (green): power indicator
2. Status indicator (red): relay status
3. High and low alarm setting switch: switch between high and low alarms
4. Sensitivity adjustment: adjust the sensitivity of the alarm
5. Delay adjustment: delay time adjustment of alarm state
6. Test button: Relay state flip test



- 1) When the meter is powered on, the green power indicator is on.
- 2) In the normal state of the instrument, the status indicator light is on and the relay is excited; in the instrument alarm state, the status indicator light is off and the relay is demagnetized.
- 3) When the switch is at the L end, it is a low alarm, the fork body is in a normal state when it contacts the material, and it is an alarm state when the fork body is suspended. The H end is a high alarm, when the fork body is suspended, it is a normal state, and the fork body is in an alarm state when it contacts the material. In normal state, terminals 7, 8 and 10, 11 are closed, and terminals 6, 7 and 9, 10 are open. In alarm state, terminals 7, 8 and 10, 11 are disconnected, and terminals 6, 7 and 9, 10 are closed. It is equivalent to the alarm state when the power is off. On the panel, the status of the relay when the fork body is suspended in the high and low alarm mode is marked respectively. Factory default high report H terminal
- 4) Sensitivity is adjusted to 3rd gear when the water surface reaches the center of the fork leaf. The smaller the sensitivity gear, the higher the sensitivity, and the closer the alarm point is to the fork. It can be adjusted as required according to the measuring medium. Special sensitivity adjustments can be customized.
- 5) Delay adjustment mainly deals with false alarms and frequent relay actions. The delay time increases clockwise from 0.1-60s. The factory default is to release the alarm delay. Other delay time and delay mode can be customized.
- 6) Pressing the instrument test button will reverse the state of the relay and indicator light, and releasing the button will return to normal. For on-site simulated alarm testing.